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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/662,847	09/15/2003	Alexander J. Roberts	GP-302409	1208
7590	05/30/2006			EXAMINER WALTERS, JOHN DANIEL
CHRISTOPHER DEVRIES General Motors Corporation Mail Code 482-C23-B21 P.O. Box 300 Detroit, MI 48265-3000			ART UNIT 3618	PAPER NUMBER
DATE MAILED: 05/30/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)
	10/662,847	ROBERTS, ALEXANDER J.
	Examiner John D. Walters	Art Unit 3618

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)  Responsive to communication(s) filed on 07 March 2006.

2a)  This action is FINAL.                            2b)  This action is non-final.

3)  Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)  Claim(s) 1,3,5,6,8-10 and 12-16 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

5)  Claim(s) \_\_\_\_\_ is/are allowed.

6)  Claim(s) 1,3,5,6,8-10 and 12-16 is/are rejected.

7)  Claim(s) \_\_\_\_\_ is/are objected to.

8)  Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

9)  The specification is objected to by the Examiner.

10)  The drawing(s) filed on 15 September 2003 is/are: a)  accepted or b)  objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)  The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)  Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a)  All    b)  Some \* c)  None of:  
1.  Certified copies of the priority documents have been received.  
2.  Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3.  Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)  Notice of References Cited (PTO-892)  
2)  Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3)  Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_  
4)  Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.  
5)  Notice of Informal Patent Application (PTO-152)  
6)  Other: \_\_\_\_\_

## DETAILED ACTION

Claims 1, 3, 5, 6, 8 – 10 and 12 – 16 have been examined.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1, 8 and 13 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Neither the specification nor the figures contain reference to activation of cylinders based on a vehicle speed threshold.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5 and 6 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Tamai et al. (6,307,277) in view of Bhavsar et al. (6,691,807).

Tamai et al. discloses a regenerative braking system for a vehicle (see Fig 1, and column 2, lines 21-29) comprising:

**re: claim 1:** a displacement on demand (DOD) engine (Fig 1, item 12) including cylinders (column 2, lines 40-41);

a battery (24);

an electric machine (18) that has motor and generator modes (column 6, lines 55-59) and that is selectively driven by a wheel of the vehicle (column 9, lines 9-17); and,

a controller (25) that detects a braking condition of the vehicle, that deactivates at least one of the cylinders in response to the braking condition (column 9, line 9 to column 10, line 5), and that operates the electric machine in the generator mode during the braking condition to charge the battery.

The system of Tamai et al. proceeds to deactivate all cylinders of the engine when in the regenerative braking state rather than maintain at least another of the cylinders active.

However, Bhavsar et al. teaches a propulsion system for a hybrid vehicle comprising a DOD engine (Fig 1, item 16; and column 3, lines 35-36), battery (15), electric machine (14) that has motor and generator modes (column 3, line 62 to column 4, line 3) and that is selectively driven by a wheel of the vehicle (column 3, lines 36-38), the system further comprising a controller (18) that is able to detect a condition of the vehicle and selectively deactivate at least one of the engine cylinders while maintaining at least another of the cylinders active (column 4, lines 21-24).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the instant invention was made to have modified the system of Tamai to control the cylinders such that in response to a braking condition of the vehicle, while deactivating one or more of the engine cylinders, at least another of the cylinders would be maintained active in response to the braking condition in accordance with the teachings of Bhavsar et al. in order to save fuel while preserving some engine cylinder activation to respond-to driver-demanded speed or torque as suggested by the Bhavsar et al. reference at column 7 lines 53 to 65.

**Regarding the features of claim 3:** wherein the controller detects termination of the braking condition and activates all of the cylinders in response to such termination, the system of Bhavsar et al. further teaches a controller that detects a change in the system state and can respond by activating all of the cylinders in response as appropriate (column 5, line 35 to column 6, line 14).

**Regarding claim 1:** wherein the controller monitors a vehicle speed and activates the at least one of the cylinders when the vehicle speed when the vehicle speed achieves a threshold (Bhavsar column 5, lines 4-8, lines 13-23, and lines 30-45).

**Regarding claim 5:** wherein the controller selectively operates the electric machine in the motor mode to drive the wheel of the vehicle (Bhavsar column 5, lines 24-47 and see Fig 3, the operational flow path 52-54-58-64, and where the battery supplies the current to the electrical machine (column 4, lines 1-2)).

**Regarding claim 6:** wherein the controller selectively deactivates all of the cylinders of the engine and operates the electric machine in the motor mode to drive the

vehicle wheel (see Bhavsar Fig 3, the "EM Mode" Block 64, and refer to the associated text of the reference).

Claims 8-10 and 12-16 are rejected under 35 U.S.C. § 102 as being anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as being obvious over Tamai et al. (6,307,277) in view of Bhavsar et al. (6,691,807).

As discussed above, the combination of Tamai et al. (-277) and Bhavsar et al. as **applied to claim 1** discloses a regenerative braking system for a vehicle in which the system comprises a controller for a Displacement on Demand (DOD) engine capable of having one or more of its cylinders deactivated while maintaining at least another cylinder of the engine active, and having an electrical machine and a battery and driving the electrical machine in a generator mode with a wheel of the vehicle to charge the battery; and, **as applied to claim 5** discloses wherein the controller selectively operates the electric machine in a motor mode to drive the wheel of the vehicle; and **further as applied to claim 1** discloses wherein the battery supplies electrical current to the electrical machine and the controller detects a braking condition and controls the activation and deactivation of the cylinders of the engine in response to a vehicle operating condition in which the method (the steps of the method of claims 8-10 and 12-16) is considered inherent.

The Examiner posits that the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1, 3, 5 and 6 teaches the claimed method of the claims 8-10 and 12-16 because the method is obviously disclosed. The rationale for this

obviousness is that the system of the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1, 3, 5 and 6, in its normal and usual application would necessarily require the claimed steps: of **claim 8** (detecting a braking condition of the vehicle, deactivating at least one cylinder of the engine in response to the braking condition while maintaining at least another cylinder of the engine active; and driving the electric machine in a generator mode with a wheel of the vehicle to charge the battery); of **claim 9** (activating the electric machine in a drive mode to drive the vehicle wheel); of **claim 10** (providing electrical current to the electrical machine from the battery); and of **claim 12** (detecting termination of the braking condition and activating at least one of the cylinders) in response to that termination); and the claimed steps: of **claim 13** (detecting a braking condition of the vehicle; deactivating a cylinder of the engine in response to the braking condition while maintaining at least another cylinder of the engine active; retarding motion of the vehicle by driving an electric machine in a generator mode with a wheel of the vehicle to generate electrical current; detecting termination of the braking condition; and activating the cylinder and relieving the retarding in response to the termination); and of **claim 14** (charging a battery with electrical current); and of **claim 15** (activating the electric machine in a drive mode to drive the wheel of the vehicle); and of claim 16 ( providing electrical current to the electrical machine from a battery). See MPEP Sec. 21 12.02, and refer *In re King*, 801 f2d 1324, 1326; 231 USPQ 136, 138 (Fed Cir 1986).

Therefore, because the prior art discloses all the structure necessary to perform the claimed functions, one of ordinary skill in the art would find the claimed method to

be an obvious step in light of the disclosed structures of the combination of Tamai et al. (-277) and Bhavsar et al. as applied above to claims 1, 3, 5 and 6.

***Response to Arguments***

Applicant's arguments filed 7 March 2006 have been fully considered but they are not persuasive.

Applicant states, "Claim 1... Tamai monitors vehicle speed and shuts off fuel flow to the engine...is opposite to that of the present invention... Bhavsar fails to cure the deficient teachings of Tamai... claims 3-6 depend from claim 1."

Initially, it should be noted, that the claims containing reference to activation of cylinders based on a vehicle attaining a speed threshold have been rejected, as such reference is not supported by the specification and figures.

In reference to Applicant's remarks, the reference to Tamai only considers a portion of the acceleration/deceleration driving cycle. Further reading of Tamai discloses fuel and spark being delivered to the engine just before a drop-to neutral point, i.e. a speed threshold (column 5, lines 30-32). Therefore, Tamai does, in fact, disclose the activation of cylinders when a speed threshold is met.

Additionally, Bhavsar is not required to teach or disclose a vehicle speed threshold as that teaching comes from Tamai.

As claims 3-6 depend from claim 1 and no further command is made upon them, claims 3-6 are subject to the above reasoning for rejection.

Applicant also states, "claims 8-10, 12 and 13-16...102(b)...or...103(a)...notes that the §102 alternative rejections are improper because the Examiner relies on a plurality of references...incorporates the above discussion with respect to claim 1."

Applicant is correct in asserting that the 102(b) portion of the referenced rejection is not proper. It is therefore withdrawn. However, the 103 portion of the rejection is held for the reasons discussed above.

For these reasons, the rejections stand.

### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure. The prior art of Tabata et al; of Matsubara et al.; of Hanada et al; of Wakashiro et al. (-320; and -460); and of Glugla et al. each show features in common with some of the other structures of the inventive concept disclosed in the instant application.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to John D. Walters whose telephone number is (571) 272-8269. The examiner can normally be reached on Monday - Friday, 8am - 5pm.

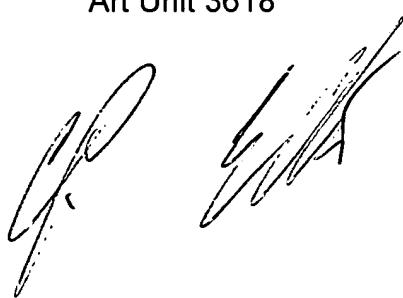
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christopher Ellis can be reached on (571) 272-6914. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

John D. Walters  
Examiner  
Art Unit 3618

JDW

A handwritten signature of "JDW" enclosed in an oval.A handwritten signature of "JP" and "CE" joined together.

CHRISTOPHER P. ELLIS  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 3600